(12) UK Patent Application (19) GB (11) 2 330 474 (13) A

(43) Date of A Publication 21.04.1999

(21) Application No 9821764.9

(22) Date of Filing 06.10.1998

(30) Priority Data
(31) 9753207 (32) 17.10.1997 (33) KR

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(51) INT CL^6
H04N 5/445

(52) UK CL (Edition Q)
H4F FBB FD1B1 FD1B3 FD12X FD22 FD30K FD32

(56) Documents Cited
EP 0701367 A2 WO 98/26596 A1 WO 98/26584 A1
WO 96/37996 A1 WO 96/07270 A1 US 5523796 A

(58) Field of Search
UK CL (Edition Q) H4F FBA FBB
INT CL^6 H04N 5/445
Online: WPI, EPODOC

(54) Abstract Title
Electronic program guide with video clips

(57) A set top box receives a broadcast signal including program service information and program guide information. This is demodulated 110 and the program guide signal is decoded and stored in a memory block 150 provided. In response to a program guide request signal 140 a program guide menu is organised 160 and displayed on a display means. If a motion picture selection signal 140 is input the motion picture relating to the program of interest in the guide is extracted from the memory block 150 and displayed. If a program selection signal 140 is input the decoded broadcast signal relating to the selected program is displayed.

FIG. 1
(PRIOR ART)

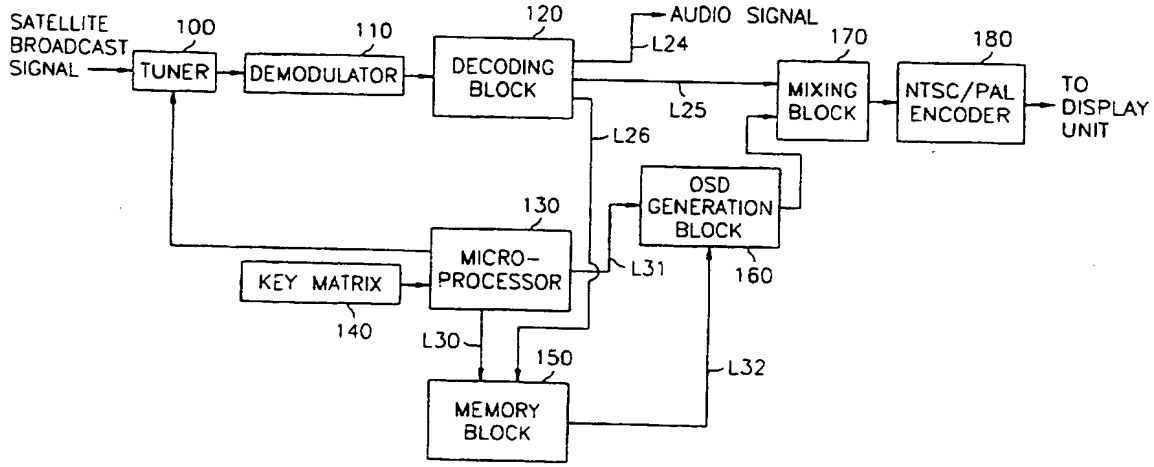

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FIG. 1
(PRIOR ART)

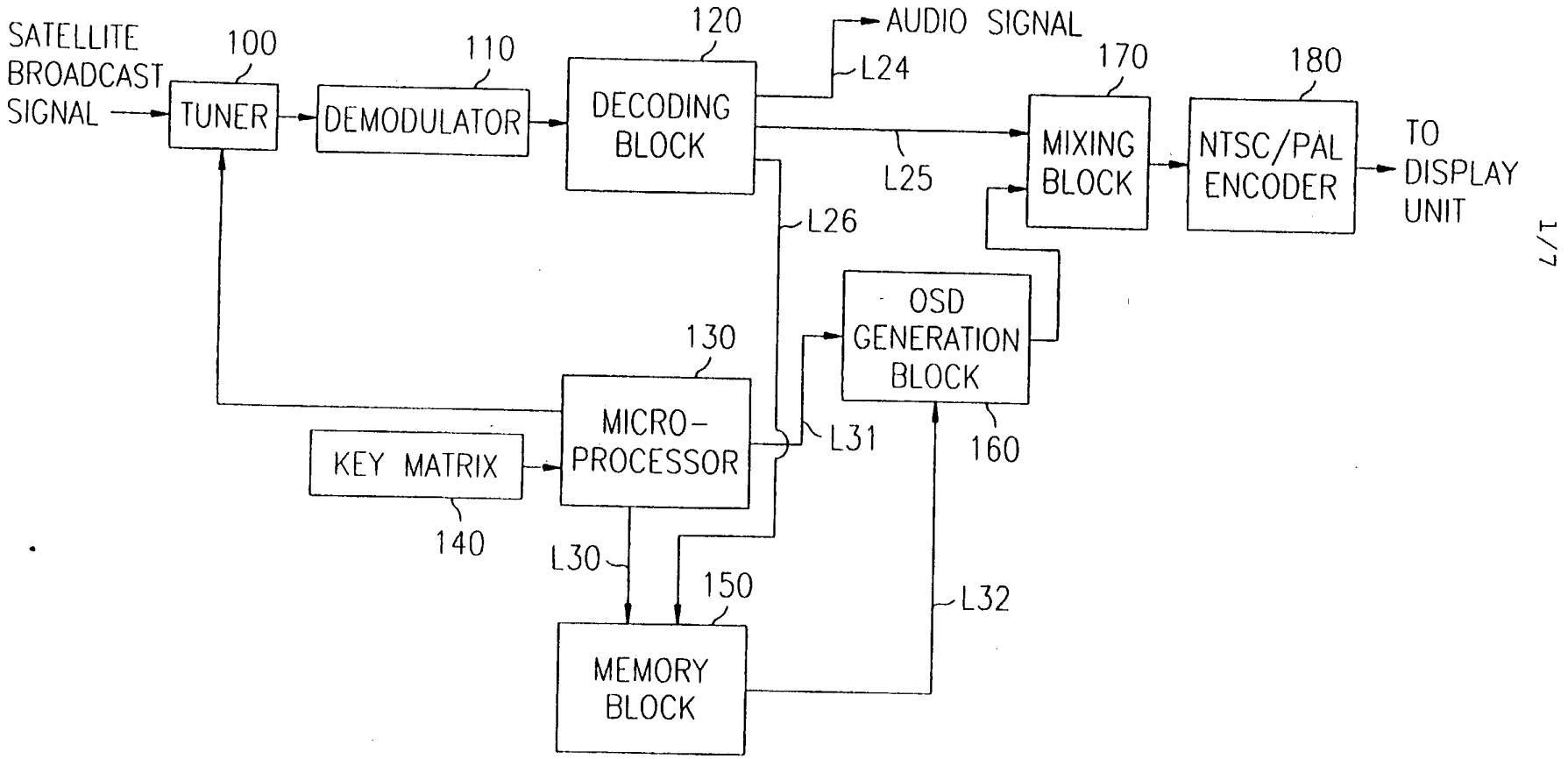


FIG. 2
(PRIOR ART)

TV PROGRAM	PROGRAM GUIDE INFORMATION		
	12:00	13:00	14:00
CH 02	KOREA BUSINESS TODAY	FOCUS ON REAL ESTATE	TODAY'S ISSUE
CH 03	HEADLINE NEWS	SECURITIES BUSINESS	PGA TODAY
CH 06	MEDICAL DRAMA: "E.R."	COMEDY: "GOOD FELLOWS"	SHOT! NOTHING IMPOSSIBLE
CH 08	CNN INTERNATIONAL WORLD NEWS	SHOWBIZ THIS WEEK	LARRY KING WEEKEND

FIG. 3A

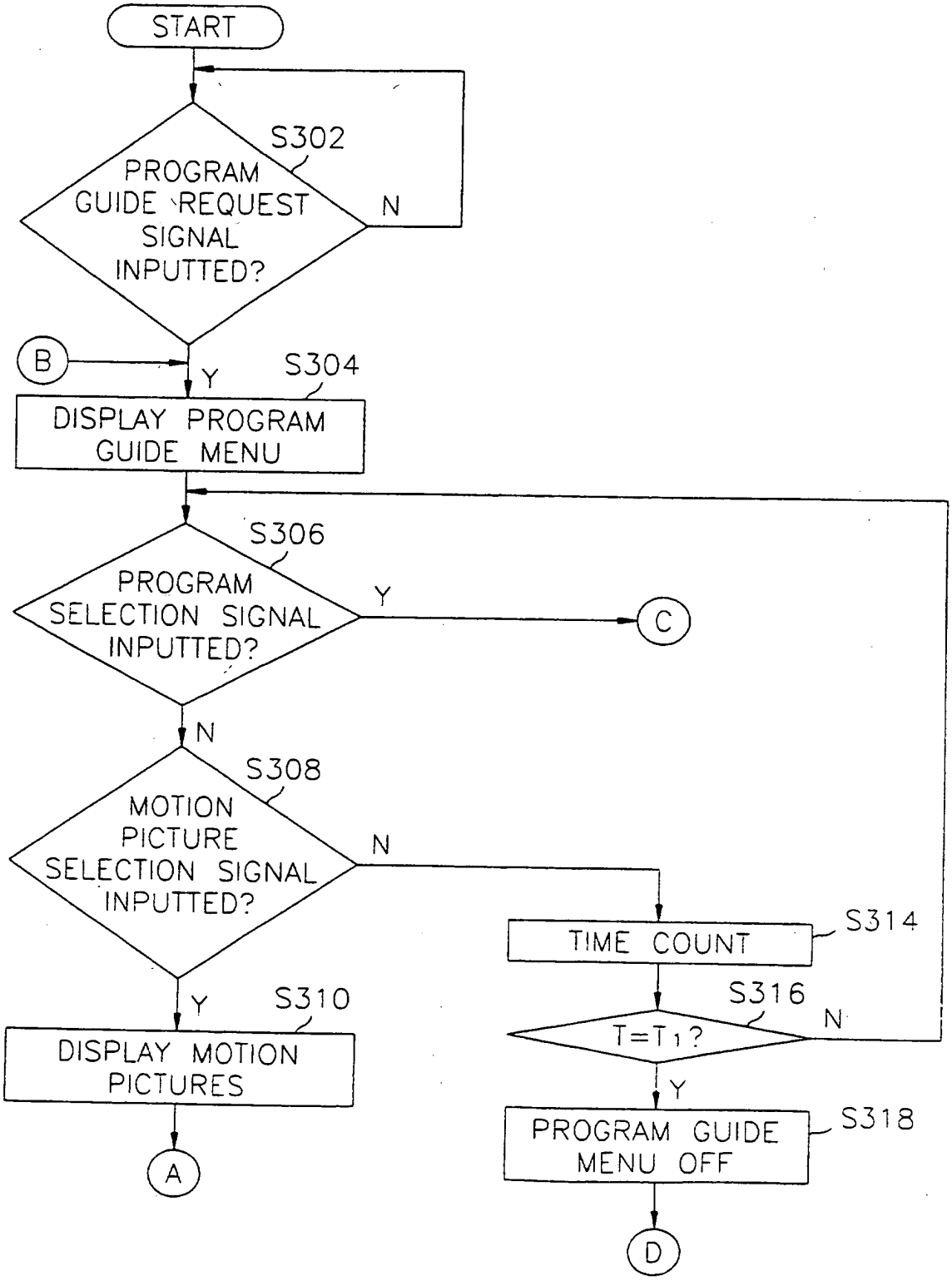

START
S302
PROGRAM GUIDE REQUEST SIGNAL INPUTTED?
N
B
Y
S304
DISPLAY PROGRAM GUIDE MENU
S306
PROGRAM SELECTION SIGNAL INPUTTED?
Y
C
N
S308
MOTION PICTURE SELECTION SIGNAL INPUTTED?
N
Y
S310
DISPLAY MOTION PICTURES
A
S314
TIME COUNT
S316
T=T1?
N
Y
S318
PROGRAM GUIDE MENU OFF
D

FIG. 3B

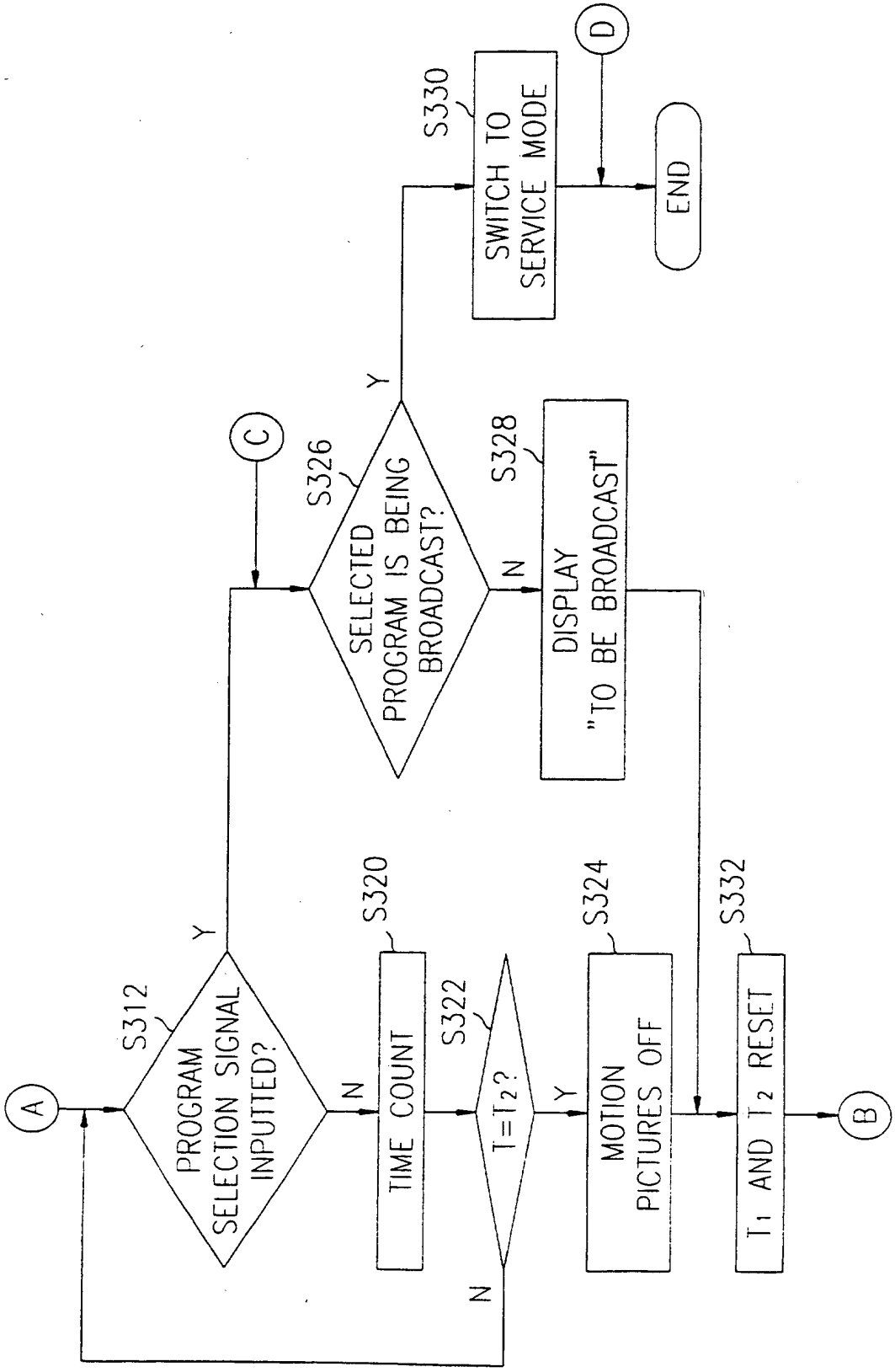

A
S312
PROGRAM SELECTION SIGNAL INPUTTED?
Y
N
S320
TIME COUNT
S322
T=T2?
N
Y
S324
MOTION PICTURES OFF
S332
T1 AND T2 RESET
B
C
S326
SELECTED PROGRAM IS BEING BROADCAST?
Y
N
S328
DISPLAY "TO BE BROADCAST"
S330
SWITCH TO SERVICE MODE
D
END

FIG. 4

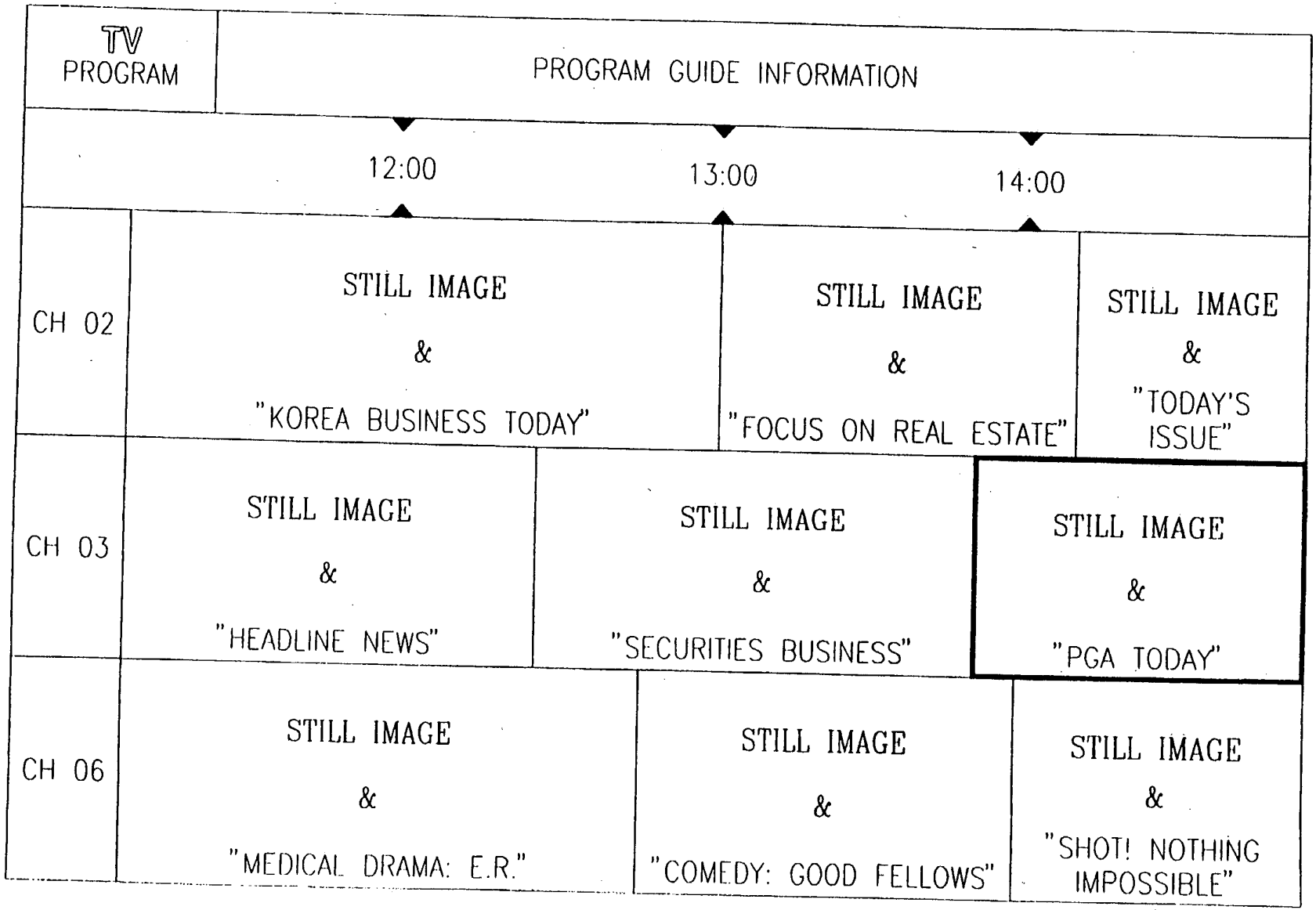

TV PROGRAM
PROGRAM GUIDE INFORMATION
12:00
13:00
14:00
CH 02
STILL IMAGE & "KOREA BUSINESS TODAY"
STILL IMAGE & "FOCUS ON REAL ESTATE"
STILL IMAGE & "TODAY'S ISSUE"
CH 03
STILL IMAGE & "HEADLINE NEWS"
STILL IMAGE & "SECURITIES BUSINESS"
STILL IMAGE & "PGA TODAY"
CH 06
STILL IMAGE & "MEDICAL DRAMA: E.R."
STILL IMAGE & "COMEDY: GOOD FELLOWS"
STILL IMAGE & "SHOT! NOTHING IMPOSSIBLE"

FIG. 5

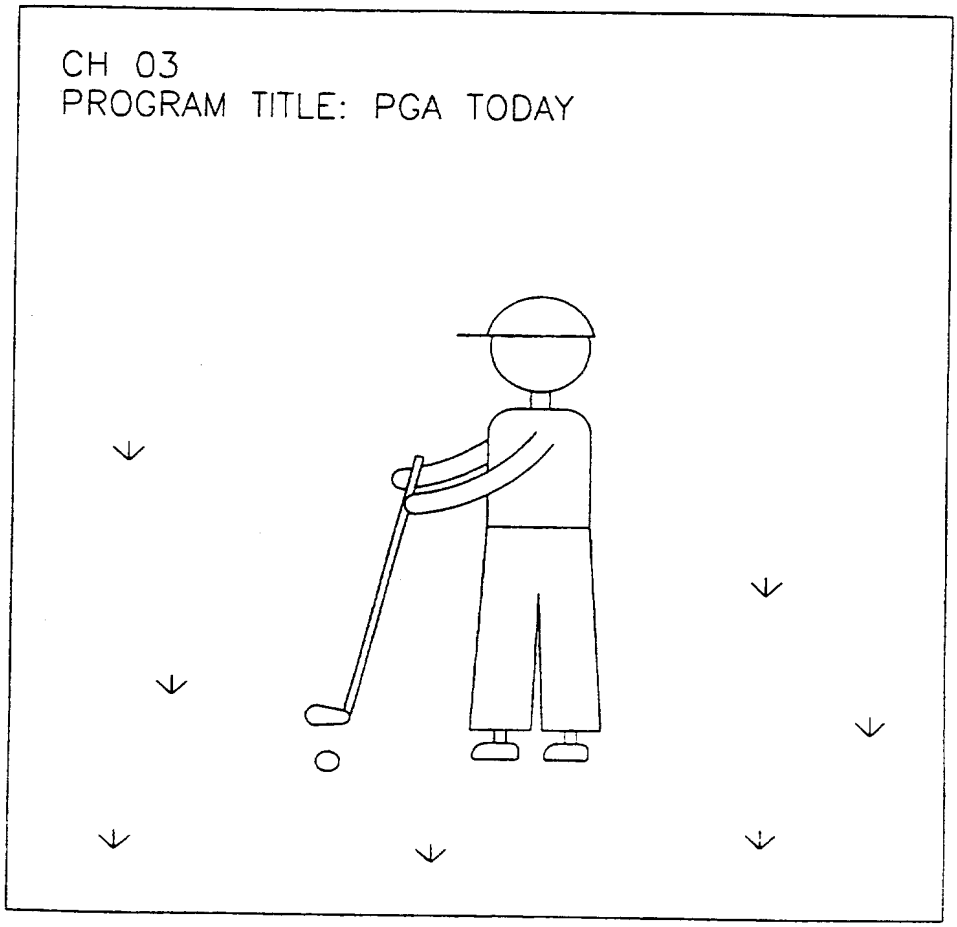
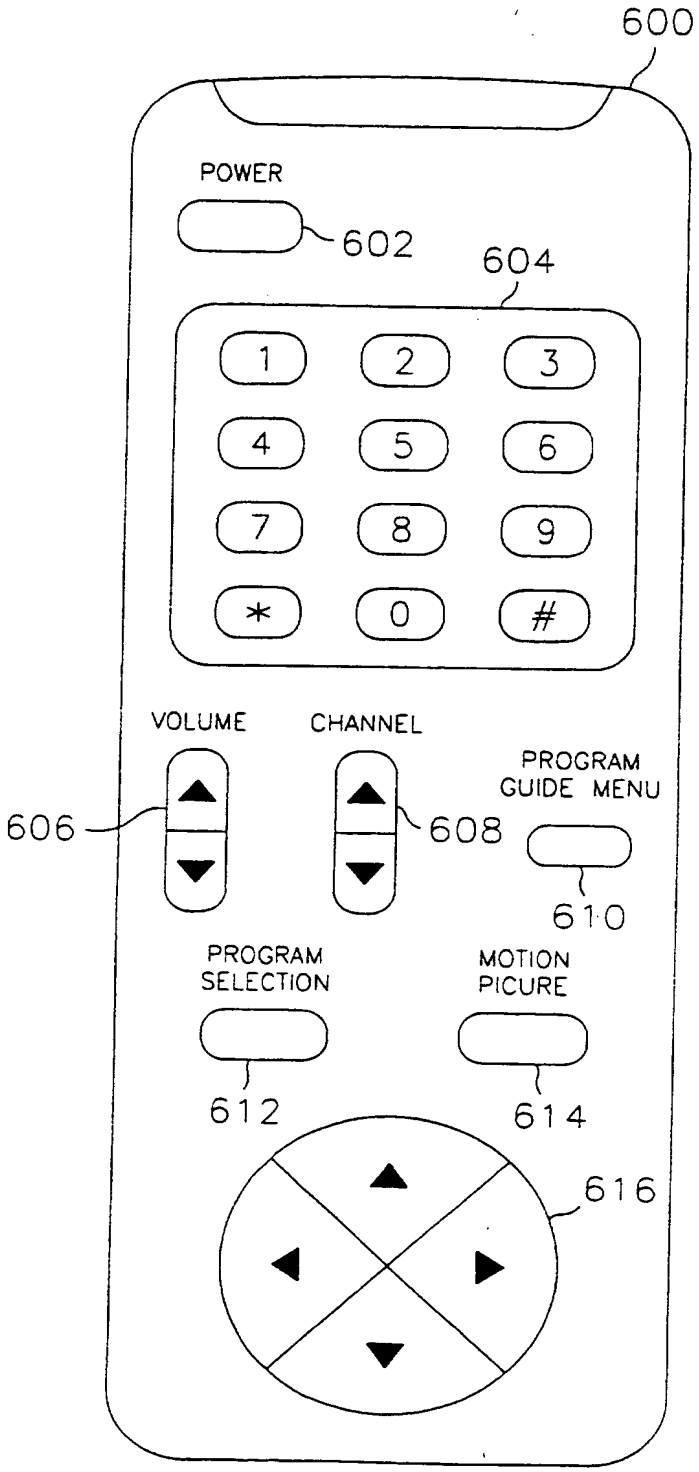


FIG. 6


600
POWER
602
604
1
2
3
4
5
6
7
8
9
*
0
#
VOLUME
CHANNEL
PROGRAM
GUIDE MENU
606
608
610
PROGRAM
SELECTION
MOTION
PICURE
612
614
616

METHOD FOR PROVIDING CHANNEL INFORMATION BY MOTION PICTURES AND STILL IMAGES IN A SETTOP BOX

The present invention relates to a method for providing channel information in a settop box; and, more particularly, to a method for providing channel information by using motion pictures and still images in a settop box.

Recently, a new broadcasting system, utilizing communication satellite and digitized broadcast signals, has been rapidly gaining popularity worldwide. The satellite broadcasting system, which can provide broadcast signals to a wide area, employs superhigh RF (radio frequency) signals whose frequencies range, e.g., from 11.7 GHz to 12.2 GHz, for carrying the digitized broadcast signals. To receive the superhigh RF signals, a satellite broadcast signal receiver (hereinafter referred to as a settop box) is normally equipped with a low noise blockdown converter for converting the superhigh RF signals into RF signals whose frequencies range, e.g., from 950 to 2050 MHz. Thereafter, a tuner employed in the settop box is tuned to a channel selected by a user using the converted RF signals.

A satellite broadcast signal of the tuned channel is demodulated by a demodulation circuit provided in the settop

box and converted into a demodulated channel signal. The demodulated channel signal includes program service information and program guide information encoded by, e.g., the MPEG (Motion Picture Experts Group) scheme. The program service information includes video and audio data for an actual program being broadcast through the tuned channel and the program guide information includes program schedule data to be broadcast through the channels of the satellite broadcasting system.

Referring to Fig. 1, there is shown a schematic block diagram of a prior art settop box for providing channel information by using the program guide information. As shown in Fig. 1, the settop box comprises a tuner 100, a demodulator 110, a decoding block 120, a microprocessor 130, a key matrix 140, a memory block 150, an OSD (on-screen display) generation block 160, a mixing block 170 and an NTSC/PAL (National Television System Committee/Phase Alternation by Line) encoder 180. The key matrix 140 provides the microprocessor 130 with input signals for executing certain functions through key inputs by a user. The key matrix 140 has, e.g., a power key, a channel up/down key, a program guide menu key, a scrolling key, an enter key for selecting and executing a certain function provided by the settop box and numerical keys for generating a channel selection signal to select a desired satellite broadcast channel. A remote controller (not shown) can be also used instead of the key matrix 140. The

microprocessor 130 generates to the tuner 100 a tuning control signal representing the channel to be tuned in response to the channel selection signal provided thereto from the key matrix 140 by the user's key input. Thereafter, the tuner 100 is tuned to a selected channel in response to the tuning control signal fed from the microprocessor 130 and outputs a tuned channel signal to the demodulator 110. The demodulator 110 demodulates the tuned channel signal and transmits the demodulated channel signal to the decoding block 120, wherein the demodulated channel signal includes the program service information and the program guide information encoded by the MPEG scheme.

In the decoding block 120, the demodulated channel signal is decoded to thereby provide reconstructed program service information and program guide information. The reconstructed program service information includes video and audio signals for a program being currently broadcast via the tuned channel and the reconstructed program guide information includes a program guide signal representing program schedules of the channels of the satellite broadcasting system. The decoding block 120 transmits the audio signal to an audio signal processor (not shown) via a line L24, the video signal to the mixing block 170 via a line L25 and the program guide signal to the memory block 150 via a line L26. The audio signal is processed in the audio signal processor and outputted through a speaker (not shown). The program guide signal is stored in

the memory block 150. The mixing block 170 mixes the received video signal with an OSD signal, if any, generated by the OSD generation block 160 to generate a mixed video signal. The mixed video signal is the video signal itself if there exists no OSD signal and is a signal constructed by overlapping the video signal with the OSD signal if otherwise. The NTSC/PAL encoder 180 converts the mixed video signal according to the NTSC or PAL standard and transmits the converted video signal to a display unit for the display thereof.

When a user inputs a command via the key matrix 140 requesting the program schedules of the channels of the satellite broadcasting system, the key matrix 140 provides a program guide request signal to the microprocessor 130. In response thereto, the microprocessor 130 instructs the memory block 150 to transmit the program guide signal stored therein to the OSD generation block 160 and directs the OSD generation block 160 to generate a program guide menu signal in the form of an OSD by using the program guide signal. And then, the OSD generation block 160 transmits the program guide menu signal to the mixing block 170.

At the mixing block 170, the video signal from the decoding block 120 and the program guide menu signal from the mixing block 170 are processed to provide the mixed video signal. The mixed video signal is processed at the NTSC/PAL encoder 180 as described above and provided to the display unit.

Referring to Fig. 2, there is shown a typical program guide menu of the prior art. As shown in Fig. 2, the conventional program guide menu merely displays title, broadcast time and channel information of the programs, without providing visual images thereof. As a result, it may not be easy for the viewer to recognize the contents thereof from the program guide menu, thereby necessitating an advanced program schedule display scheme.

It is, therefore, an object of the present invention to provide a method for providing program information by using motion pictures and still images in a settop box.

In accordance with the present invention, there is provided a method for providing program information in a settop box, comprising the steps of:

(a) receiving a broadcast signal including program service information and program guide information, wherein the program service information has audio and video data and the program guide information has text data and image data;

(b) demodulating the broadcast signal to generate an audio signal, a video signal and a program guide signal;

(c) decoding the audio signal, the video signal and the program guide signal, and storing the decoded program guide signal in a memory block provided in the settop box, wherein the decoded program guide signal represents schedules of

programs provided through channels of a broadcasting system and has the text data and the image data, the image data containing motion pictures and still images for the programs;

(d) organizing, in response to a program guide request signal, a program guide menu by using the text data and the image data of the decoded program guide signal;

(e) displaying the program guide menu for a predetermined time interval T_1 on a display means;

(f) determining whether a motion picture selection signal is inputted for the predetermined time interval T_1;

(g) displaying, in response to the inputted motion picture selection signal, the motion pictures stored in the memory block on the display means for a predetermined time interval T_2;

(h) examining whether a program selection signal is inputted for the predetermined time interval T_2; and

(i) displaying, in response to the inputted program selection signal, the decoded video and audio signals for a program corresponding to the displayed motion pictures on the display means.

The above and other objects and features of the present invention will become apparent from the following description of preferred embodiments given in conjunction with the accompanying drawings, in which:

Fig. 1 illustrates a schematic block diagram for a conventional settop box capable of providing a program guide menu;

Fig. 2 presents a conventional program guide menu;

Figs. 3A and 3B depict a flow chart for displaying the program guide menu of motion pictures in accordance with the present invention;

Fig. 4 represents a program guide menu in accordance with the present invention;

Fig. 5 exemplifies motion pictures of a specific program displayed on a screen in accordance with the present invention; and

Fig. 6 shows a plane view of a remote control unit which produces operation signals to the settop box shown in Fig. 1.

One of the preferred embodiments of the present invention will be described with reference to Figs. 1 to 6. A satellite broadcast signal of a tuned channel includes encoded program guide information and program service information, the latter including audio and video data for a program being currently broadcast via the tuned channel. It is assumed that the program guide information in the satellite broadcast signal includes text data, i.e., conventional program schedule data corresponding to the program guide menu shown in Fig. 2, and image data of the programs in the program guide menu. The

image data of each program includes video data for a sequence of predetermined number of pictures capable of providing representative motion pictures or images of the program; and one of the pictures can be used for providing a still image of the program. The satellite broadcast signal of the tuned channel is processed as in Fig. 1 and an audio signal, a video signal and a program guide signal provided by the decoding block 120 are fed to the audio signal processor (not shown), the mixing block 170 and the memory block 150, respectively, the program guide signal representing the program guide information.

Referring to Fig. 6, there is shown a remote control unit 600 which produces operation signals to the settop box shown in Fig. 1 in response to a user's key input. The remote control unit 600 includes a power key 602, numeral keys 604, a volume up/down key 606, a channel up/down key 608, a program selection key 612, a motion picture selection key 614, a scrolling key 616 and a program guide menu key 610. The function of the remote control unit 600 is identical to that of the key matrix 140 shown in Fig. 1, excepting for that of the program selection key 612 and the motion picture selection key 614.

Now, a method for providing program information by motion pictures and still images in accordance with the present invention will be described.

Referring to Figs. 3A and 3B, there are shown a flow

chart illustrating the above method. In a view mode, i.e., when a program of the tuned channel is displayed on a display unit, the microprocessor 130 shown in Fig. 1 examines whether the user inputs a program guide request signal through the program guide menu key 610 of the remote control unit 600 shown in Fig. 6. In case that the examination result is negative at step S302, the microprocessor 130 returns to step S302, and if otherwise, it proceeds to step S304. At step S304, the microprocessor 130 directs the memory block 150 to transmit the program guide signal stored therein to the OSD generation block 160 and instructs the OSD generation block 160 to generate and transmit a program guide menu signal to the mixing block 170 and then to the NTSC/PAL encoder 180, thereby displaying the program guide menu on the display unit. Referring to Fig. 4, there is shown the program guide menu being displayed at step S304, the program guide menu providing the titles of the programs, e.g., "KOREA BUSINESS TODAY", "FOCUS ON REAL ESTATE" and the like, broadcast time, channel number and still images corresponding to the respective programs. The program guide menu is displayed in the form of a predetermined OSD form, e.g., a rectangular shape, and one of the programs is highlighted.

Thereafter, the microprocessor 130 proceeds to step S306 and determines whether the user selects one of the respective programs in the program guide menu by using the scrolling key 616 and the program selection key 612 of the remote control

unit 600. That is, the microprocessor 130 determines whether the user has moved the highlighted rectangular shape to a desired program position in the program guide menu by using the scrolling key 616 and in turn inputs a first program selection signal through the program selection key 612 in order to view the selected program. If the determination result is positive at step S306, the microprocessor 130 proceeds to step S326 shown in Fig. 3B.

At step S326, the microprocessor 130 examines whether the selected program corresponding to the first program selection signal inputted by the user is currently being broadcast. In case that the examination result is negative at step S326, the microprocessor 130 proceeds to step S328 and displays a message, e.g., "TO BE BROADCAST", on the display unit at a predetermined position thereof and then proceeds to step S332. If otherwise, in response to the first program selection signal, the microprocessor 130 proceeds to step S330; instructs the OSD generation block 160 to eliminate the program guide menu from the display unit; switches to a service mode, thereby providing the selected program; terminates the process.

In case that the determination result is negative at step S306, the microprocessor 130 proceeds to step S308 and examines whether the user moves the highlighted rectangular shape to a specific program position by using the scrolling key 616 and inputs a motion picture selection signal through

the motion picture selection key 614 in order to view motion pictures corresponding to the specific program selected. If the examination result is negative at step S308, the microprocessor 130 proceeds to step S314 and performs a time counting for the program guide menu display. Thereafter, at step S316, the microprocessor 130 determines whether the time counting for the program guide menu display reaches to a predetermined time interval T_1. If the determination result is negative at step S316, the microprocessor 130 returns to step S306, and if otherwise, it proceeds to step S318. At step S318, the microprocessor 130 instructs the OSD generation block 160 to eliminate the program guide menu from the display unit and terminates the process.

In case that the examination result is positive at step S308, the microprocessor 130 proceeds to step S310. At step S310, in response to the motion picture selection signal, the microprocessor 130 instructs the memory block 150 to transmit the motion pictures stored therein to the OSD generation block 160 and then further transmit same through the mixing block 170 and the NTSC/PAL encoder 180 to be displayed on the display unit. Referring to Fig. 5, there is shown the motion pictures of the selected specific program, e.g., "PGA TODAY", displayed at step S310 together with its corresponding channel number and program title.

Thereafter, the microprocessor 130 proceeds to step S312 shown in Fig. 3B and examines whether the user inputs a second

program selection signal through the program selection key 612 in order to view the whole contents of the selected specific program corresponding to the motion pictures being currently displayed on the display unit. If the examination result is positive at step S312, the microprocessor 130 proceeds to step S326 and examines whether the selected specific program corresponding to the second program selection signal inputted by the user is currently being broadcast. In case that the examination result is negative at step S326, the microprocessor 130 proceeds to step S328 and displays a message, e.g., "TO BE BROADCAST", on the display unit at a predetermined position thereof and then proceeds to step S332. If otherwise, in response to the second program selection signal, the microprocessor 130 proceeds to step S330 and instructs the OSD generation block 160 to eliminate the motion pictures from the display unit and switches to a service mode, thereby providing the selected program and terminates the process.

If the examination result is negative at step S312, the processor 130 proceeds to step S320 and performs a time counting for the motion pictures display and determines whether the time counting reaches to a predetermined time interval T_2 at step S322. If the determination result is negative at step S322, the microprocessor 130 returns to step S312, and if otherwise, it proceeds to step S324, instructs the OSD generation block 160 to terminate the motion pictures

display and proceeds to step S332. At step S332, the microprocessor 130 resets the predetermined time intervals T_1 and T_2 with zero and returns to step S304 shown in Fig. 3A.

As described above, in accordance with the present invention, when the user inputs the program guide request signal by using the remote control unit 600, the settop box displays program information accompanied with the still images corresponding to the respective programs showing the motion pictures. Therefore, in accordance with the present invention, the method for providing the program information by using the motion pictures and the still images meets the demand of the user for advanced program guide information.

While the present invention has been described with respect to certain preferred embodiments only, other modifications and variations may be made without departing from the scope of the present invention as set forth in the following claims.

Claims

1. A method for providing program information in a settop box, comprising the steps of:

(a) receiving a broadcast signal including program service information and program guide information, wherein the program service information has audio and video data and the program guide information has text data and image data;

(b) demodulating the broadcast signal to generate an audio signal, a video signal and a program guide signal;

(c) decoding the audio signal, the video signal and the program guide signal, and storing the decoded program guide signal in a memory block provided in the settop box, wherein the decoded program guide signal represents schedules of programs provided through channels of a broadcasting system and has the text data and the image data, the image data containing motion pictures and still images for the programs;

(d) organizing, in response to a program guide request signal, a program guide menu by using the text data and the image data of the decoded program guide signal;

(e) displaying the program guide menu for a predetermined time interval T_1 on a display means;

(f) determining whether a motion picture selection signal is inputted for the predetermined time interval T_1;

(g) displaying, in response to the inputted motion picture selection signal, the motion pictures stored in the

memory block on the display means for a predetermined time interval T_2;

(h) examining whether a program selection signal is inputted for the predetermined time interval T_2; and

(i) displaying, in response to the inputted program selection signal, the decoded video and audio signals for a program corresponding to the displayed motion pictures on the display means.

2. The method according to claim 1, wherein the decoded program guide signal contains the schedule of the programs currently being broadcast and the programs to be broadcast via the broadcasting system.

3. The method according to claim 2, wherein the respective still images correspond to the respective programs in the program guide menu.

4. The method according to claim 3, wherein the respective motion pictures correspond to the respective programs in the program guide menu.

5. The method according to claim 4, wherein the respective still images corresponding to the respective programs are selected from the respective motion pictures corresponding to the respective programs.

6. The method according to claim 5, wherein the program guide menu is in an on-screen display form.

7. The method according to claim 6, wherein the program guide menu is displayed based on an NTSC scheme.

8. The method according to claim 7, wherein the program guide menu is displayed based on a PAL scheme.

9. A method for providing program information substantially as herein described with reference to or as shown in Figures 1 to 6 of accompanying drawings.

The Patent Office

INVESTOR IN PEOPLE

Application No: GB 9821764.9 **Examiner:** Joe McCann
Claims searched: All **Date of search:** 25 January 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): H4F(FBA,FBB)

Int Cl (Ed.6): H04N(5/445)

Other: Online: WPI, EPODOC

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	EP 0701367A2	(THOMSON CONSUMER ELECTRONICS) - see abstract	1-8
XP	WO 98/26584A1	(PREVUE INTERNATIONAL) - see abstract	1-8
XP	WO 98/26596A1	(STARSIGHT TELECAST INC) - see abstract	1-8
X	WO 96/37996A1	(BRITISH SKY BROADCASTING LTD) - see abstract	1-8
X	WO 96/07270A1	(H.C.YUEN ET AL) - see abstract	1-8
X	US 5523796	(MARSHALL ET AL) - see abstract	1-8

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